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THE TEACHING PRAXIS IN THE TEACHING OF CHEMISTRY: THE PERCEPTIONS OF FIRST-YEAR STUDENTS FOR THE CONSTRUCTION OF KNOWLEDGE IN SCHOOL DAILY LIFE

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ABSTRACT

In this work, a case study was conducted based on the students' perception of chemistry classes in a public school in Ceará. The way teachers teach and how students learn has become research themes in various academic papers. It was verified through the application of a questionnaire and monitoring of chemistry classes as the students have been perceiving the practices of chemistry teachers. The work developed took place in the public school Casimiro Leite de Oliveira, and understood from the application of questionnaires to the follow-up of the chemistry teacher's class in the 2nd year B. The subjects of Physics, Sociology and Chemistry were the ones that did not present preference among students, however the subject of Physical Education is the best placed by the students. Most students find chemistry interesting and curious, even considering it boring, but not destimulating for their study. The teacher's class was considered good by most students and did not find it demotivating. Most students stated that the teacher never took them to the laboratory, but they find it interesting when the teacher uses a fact of everyday life to facilitate the learning of the contents and that most attribute to themselves for their performance in chemistry. It is expected that this work will serve as a reference for the opening of new channels of discussion and reflection on the teaching and learning process in schools.

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INTRODUCTION

Since the past days of humanity, communication, whether verbal or not, has been the means used for people to understand the various processesof dialogue. In the educational context, historically, teaching was concentrated in the figure of the teacher, building a teaching based on the Cartesian model, with a broad appreciation of the transmission of information to students. The teaching and learning process in Chemistry has undergone several changes in teaching and learning teachers and students. Thus, this exchange of knowledge, information and dialogues between societies resulted in an intense process of improvement and improvement regarding the relationship between teachers and students.The teaching and learning process has

been constantly evaluated, questioned and improved by different educators. To discuss and reflect on these issues, is to understand how this achievement occurs in its essence. The student view on these processes in the classroom is of fundamental importance for the development of work to improve the exchange of knowledge in the classroom between teachers and students.

Currently, the teaching of chemistry in basic education schools has undergone a process of change in the way this subject has been taught and how students are learning this subject. The lack of interest and understanding of disciplines such as chemistry is often due to the lack of more contextualized classes that are inserted in the daily life of the student, it is a problem experienced in public schools in Brazil. According to Silva (2006): "The teaching of chemistry in high school has been through several problems, especially with regard to the lack of interest of students. It is known that many students have difficulties in learning Chemistry, at different levels of teaching, either because they do not understand its meaning or because they do not understand its validity. This is accentuated when the content to be learned by them is not properly contextualized, not arousing their interest and motivation." That is, students should not be entirely responsible for their poor performances or disinterest in learning chemistry. But, let us report that it is a whole set, teacher/student and teach/learn. It is necessary to give teachers the means to demonstrate to their students that Chemistry is present in their life, causing them to arouse interest in the study of this subject. Chemistry is one of the sciences that fascinates people most in contesting truths, this is due to the power of conviction in what it conveys about the veracity of a chemical phenomenon. Teaching and learning are processes that today's humanity has wondered about how best to be accomplished, or if there is a plausible way to craft the right recipe. According to Filgueiras (2007), man has always sought to understand the phenomena and mysteries of the world around him, and this search is a long odishe, in which many strive, even dedicating their whole lives to him.So, it will be the practice of chemistry of fundamental importance to delight students by this science. The union between chemical theory and the application of this theory in the daily life of students will result in a beautiful learning about chemical phenomena.

According to Farias (2010), in any discipline based on the observation of natural phenomena, practices are key points for true learning. As far as chemical science is concerned, this is particularly true. Thus, it is necessary to develop pedagogical strategies in the teaching of chemistry, which has aroused the interest of schools and universities, arising from academic works of completion of courses and theses. The search to bring effective solutions to the problems that current teaching presents is important to provide students with effective learning, discussion and reflection on actions in the classroom. The experience as a temporary chemistry teacher, often heard from critical students about the discipline, complaints about how difficult the subject is, questions about the importance of studying it, what relation mathematics has with such a subject and statements that the teacher does not know how to teach.The consultation in the literature allowed to support the theme of the students' perception about chemistry classes, which resulted in a case study. The interest in knowing the students' opinion about the practices of chemistry teachers and reports of colleagues who are effective teachers of the state school system of Ceará, reinforced the idea to develop the work raising the questions below. How do chemistry teachers perform their activities in the classroom? What pedagogical tools are used to facilitate the teaching and learning process of students? Does the school have good physical conditions, equipped classrooms, a chemistry laboratory, or other places suitable for study? How do students in this school perceive all these issues? These were the factors that led to the development of this work. It is clear the need to practice an education focused on student development. And this should not be a work not only in the area of chemistry, but also in other areas, so that the way of teaching and learning, both of teachers and students, can be rethought. It is known that education is fundamental for the economic and social development of any country. Therefore, it is essential to periodically evaluate the quality of education in schools. Therefore, it is important to raise a discussion about teacher training and practices. It is necessary to review the points of school education in order to work and develop strategies in an appropriate way so that students have an educational training that is efficient in their life. Thus, one must insist on the idea that they must acquire knowledge to become critical citizens and transform society.

The work will be carried out through an evaluation of the classes of chemistry teachers in high school casimiro Leite de Oliveira, carried out from the perception of the students, dealing with a case study. Your impressions will be collected from the application of questionnaires. This practice can give indications of problems in the teaching of chemistry that must be evaluated and solved. It is expected that this work can contribute to the discussions about the conceptions of the curricula of chemistry teachers and their practices. If there is a confirmation of the need to seek new ways of teaching the discipline, it is at the same time, enabling mechanisms for teachers to work better from the observations made in the students.

MATERIALS AND METHODS

Initially, we sought in the literature works on the theme that will be developed. After consulting articles, monographs and books, it was possible to gather information and data to continue its development. The work is structured in the field research, preparation of the questionnaire and follow-up of the teacher's classes that resulted in debate among the students. The perspective adopted for the development of the research has a quantitative focus and sought to develop both in the teaching and student vision a process of reflection and analysis for the understanding and construction of space in the classroom. According to Triviños (1987), the research design that supports the present work is the Case Study, which goes back to the description, for the interpretation of the observed reality.

School research focus: The research was carried out at the Casimiro Leite de Oliveira Elementary and High School, located at Rua Sérgio Protázio da Silva s/n, São José, Pacatuba, Ceará. The school belongs to the 1st CREDE-SEDUC/CE with MEC code: 23.08.24.76. The school has 1,140 students all regularly enrolled in the state network, being distributed in the three morning, afternoon and evening shifts. As for the faculty, the school has three chemistry teachers, two of them effective and the other temporary.

Search target audience: The work was developed with the students of the 2nd year B of high school. Approximately two five percent (2.5%) commas were removed of the students' population to carry out the study, twenty-four students. Thus, data from twenty-four of the second year B on the theme in question were collected. According to Crespo (2009), the group of entities with at least one common characteristic is called statistical population or statistical universe. A sample is a finite subset of a population.

Preparation of the questionnaire: To start the work, a first contact with all students in the class was made to communicate and clarify to the students about the work that would be developed, in addition to requesting them cooperation to perform the activity. In the preparation and application of the questionnaire to the students, we used the literature of authors who addressed the teaching and learning process in the chemistry discipline who had already worked with questionnaires. Nascimento (2006), the process of teaching and learning in chemistry begins, whatever the case, with some reflections that underlie the making of important decisions: what to teach, how to teach and why to teach. The questionnaire was prepared in order to verify how chemistry teachers have been performing their practices in the classroom according to the students' opinions. At the same time, their perceptions about the existence of the teaching and learning relationship during chemistry class were analyzed. The questionnaires were administered among the students present in the classrooms, all the questions were read together with the students so that all doubts were clarified. It is emphasized that the teacher was absent during the application of the questionnaire so that all students felt comfortable. After the return of the answered questionnaire, the material was

organized and stored for analysis and preparation of the graphs of results.

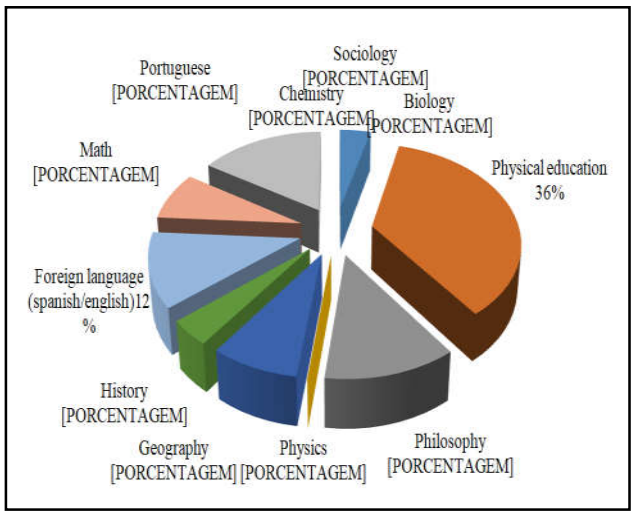
Follow-up to the chemistry teacher's class: After an exploratory study conducted at the school through the questionnaire, some chemistry classes were monitored in the class of 2nd grade B. In addition, after the classes the students were taken to another school environment to conduct a debate among the students themselves composed of questions about the class, being recorded with their permission and the school , not being able to be disclosed, if not in this work, only a few excerpts in words. The students' view of the topics about the teaching and learning process, how they perceive these practices of chemistry teachers, how teachers structure their practices and what they think of chemistry. This activity allowed students to express their opinions about the teacher's class with questions and answers that were recorded during a roundtable discussion. The students reported their opinions that were exposed after the end of the class about the teacher's practice in the classroom, such as: the teacher's entrance into the classroom, whether he reviewed the last class, how he organized the board, asked the students if they had doubts about the content, whether they related the theoretical content with daily life, what pedagogical tools were used. In addition, it was also discussed about the behavior of students during classes. The first meeting was held in the school auditorium with five students and a day later, the second meeting was held with five other students from the same class, not the previous ones. The venue chosen was the school's sports court.

RESULTS AND DISCUSSION

To evaluate the students' opinion about chemistry classes, a questionnaire was applied to the students of the 2nd grade B class of the high school casimiro Leite de Oliveira. Data were collected, thus, a diagnosis was made on the theme in question. The data collected in the research are quantitative.Six graphs were elaborated in the order of application of the questions, the data received a percentage treatment (%), considering that the total number of students in the class represents one hundred percent (100%).

Question 1: What discipline do you like the most?

Question one (01) asked the student which subject he likes best. In response, several options of subjects were available, but only one of the alternatives was chosen, depending on which one, it has affinity. The answers obtained for this question were compiled in Figure 1.



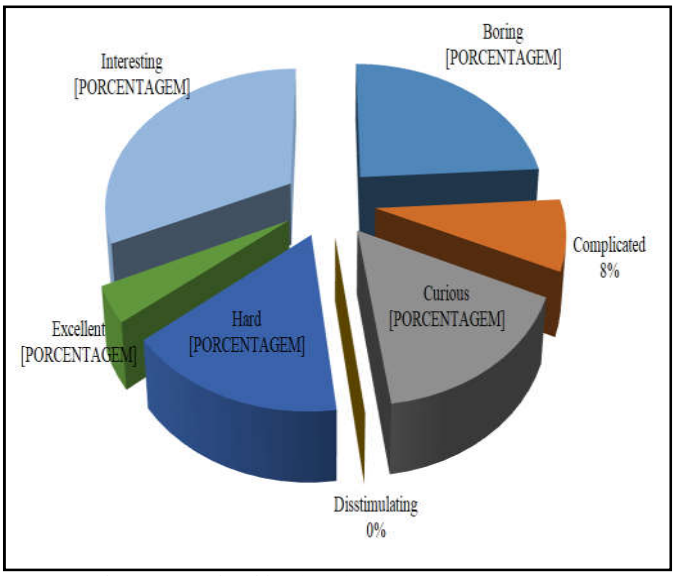
Source: Author's personal archive (2013).

Figure 1. Choose the discipline the student likes the most.

According to the results of Figure 1, it was found that the subject of physics and sociology were the ones that presented almost no preference among the students, with the matter of chemistry being the sixth least voted in a universe of twelve subjects. While physical education, Portuguese, foreign language and philosophy were the preferred subjects observing the sum of the opinion of all students in the class. A greater choice on the part of students in the disciplines of Physical Education and Portuguese, may have given themselves to the fact that they already come from the first years with contact in the school of sports practice and learning the Brazilian Portuguese language. None of the students chose chemistry as the best discipline.

Question 2: What do you think of chemistry discipline?

In the second question, the students' opinion about the chemistry discipline was evaluated, in which item they would classify this discipline. Several questions were presented considering the degree of complexity that each one could consider and boost a coherent response in the choice of the student. The results obtained for this question are shown in Figure 2..



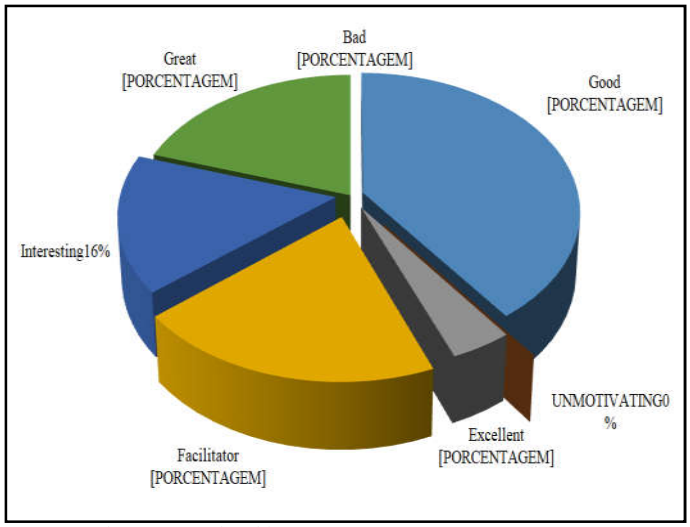
Source: Author's personal archive (2013).

Figure 2. Students' opinion about chemistry discipline

When asked what they thought of the chemistry discipline, it was observed that not one student of the class pointed to the discipline of Chemistry as a stimulant. However, it was found that the most voted the most voted by some students in the class were the boring quesitos (24%) and Interesting (32%) chemistry, followed by curiosa (16%) and Difficult (16%). Thus, despite a discipline considered by students difficult and complicated, chemistry is also seen as curious and interesting. This shows that there is an interest of the student in the subject of the subject matter, but that it is difficult to understand it. Chemistry is already presented to students since the ninth year of elementary school two and is given an emphasis on the topics of general and analytical chemistry in the 1st year, in the 2nd year is presented with emphasis on chemical physicist and 3rd year as completion of high school is seen organic chemistry. It is where students can arouse their interest in this area, know and develop their skills.

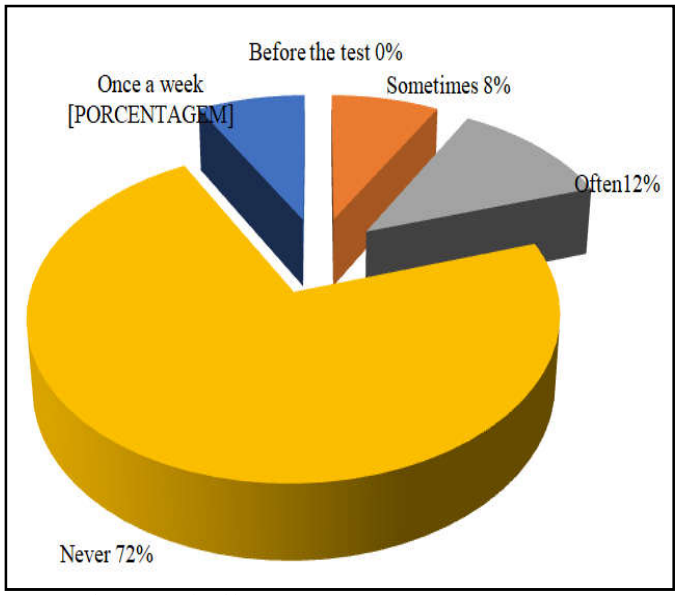
Question 3: How do you evaluate the chemistry teacher's class?

This question contemplated the students' opinion when asked about the chemistry teacher's class. Students were able to express their opinions about the quality of the class. The results collected are shown in Figure 3. When asked which item they would classify the chemistry teacher's class (Figure 3), it was found that no student pointed to the teacher's class as demotivating. However, the most voted in the students' opinions were Good (40%), followed by facilitators (20%) and Optimal (20%). The excellent and interesting things together obtained a percentage value of 20%. The students classified the teacher as a good educator, however, according to some students, in interviews given, through dialogue, the chemistry teacher did not



Source: Author's personal archive (2013).

Figure 3. Opinion about the chemistry teacher's class



Source: Author's personal archive (2013).

Figure 4. Professor versus Chemistry Lab

relate his class to a fact of daily life. This happened, according to the students, because there was no time due to the fulfillment of the curriculum, at times did not ask who had doubts and once, simply continued his class on a whiteboard using a brush in most classes. According to Nascimento (2006): "It is based on the premise of the document that gives summary importance to interdisciplinarity and contextualization of content, we understand that the teaching of Chemistry must change in the sense of demystifying scientific knowledge, linking it with what is around it, the causes and consequences of chemical phenomena in the most diverse areas and in the real world." That is, the chemistry teacher in his classes should not limit himself only to passing on content without verifying if students are learning or if they have doubts about what was being taught. To make the student learn a certain content of chemistry is at the same time work the contextualization of their class and interdisciplinarity, is is contributed to the professional training of the student for their learning process.

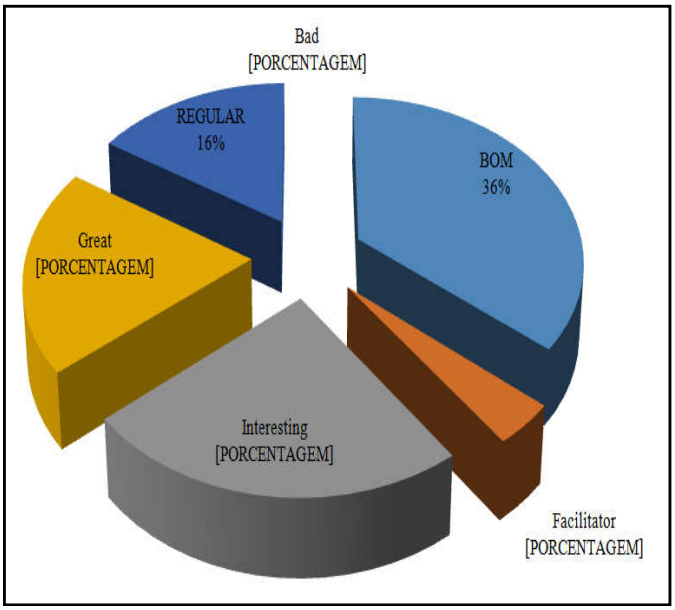
Question 4: Does the chemistry professor take you to the lab to do a chemical experiment?

In this question, it was possible to evaluate the students' opinion about the teacher's use of the chemistry laboratory and the collected impressions are shown below (Figure 4). When asked about how often the chemistry teacher took them to the laboratory, most students (72%) pointed to the item Never, that is, the teacher at no time took them to the laboratory. The sum of the other items in percentage terms was 28% and not one student pointed to the item Before the test. According to Farias (2010): "The execution of practical activity in Chemistry is fundamental not only for fundamental skills and competences to be developed, but also for the student to appreciate logic, and, why not say, the beauty involved in the discovery of knowledge." It is understood that chemical theory is not enough for the teaching process and the use of the laboratory in this area becomes an important ally of the teacher in learning the contents, the student perceives in practice what is seen in the theory, observes the phenomena and interprets them. In addition to their academic training, pedagogical strategies and tools, didactic games become great allies of the teacher in the teaching and learning process.

When accompanying some chemistry classes in March 2013 in the 2nd year, it was possible to observe that the teacher did not take the students to the laboratory at the school, even though it had a laboratory available for practical classes. However, it was perceived that the teacher reported cases involving chemistry experiments such as the existence of hydrogen gas, the students reported that sometimes chemistry classes, when this way happened, become more pleasant to watch and understand what the teacher was talking about. Figure 4 shows disparities in some things. Some students seem to relate the answer to this question with another moment experienced in past grades, it is important to emphasize that they were informed about the application of the questionnaire.

3Question 5: What do you think when the chemistry teacher uses everyday events, such as the environment, for example, to facilitate the teaching of chemistry content in your class?

This question verified the student's opinion on the importance of relating the obtaining of minerals using chemical physical processes with everyday events in the classroom. The data is organized in figure 5 below.



Source: Author's personal archive (2013).

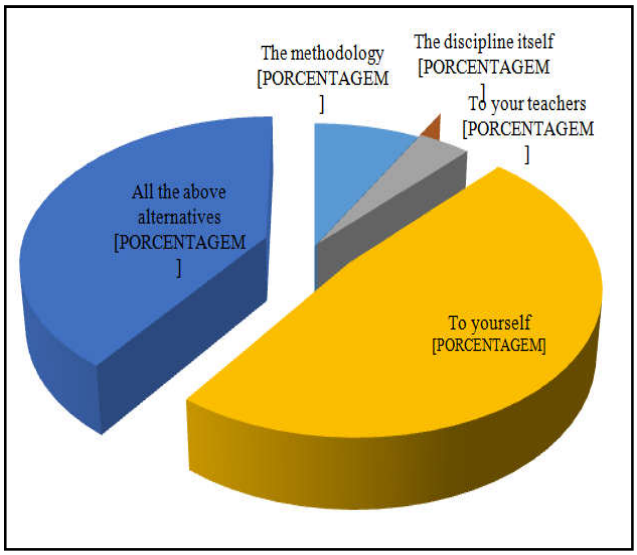
Figure 5. Everyday event versus chemistry class

When asked what they thought of the chemistry teacher relating their class to a daily event, some students pointed to the questions Good (36%), Interesting (24%) and Great (20%), being the first two the best voted. No student in the class stated that he thought it was bad when the teacher used everyday events in his classes. According to reports of the students in a personal interview granted (2nd year), they stated that when the teacher took to the classroom event about the oil spill that was being disseminated by the television media, the classes of chemical physicist sat more interesting and they understood more the contents.

Other students reported that the teacher took to the video room and there was shown the various stages of separation of oil, its derivatives, materials produced from oil such as plastics and rubber.

Question 6: To whom do you attribute responsibility for your performance in chemistry discipline?

This question contemplated the students' opinion about who is responsible for their performance in chemistry. The data were organized in figure 6 below.



Source: Author's personal archive (2013).

Figure 6. Main responsible for performance in chemistry discipline

When asked about the likely responsible for their performance in the chemistry discipline, it was found that most of the students attributed to themselves the responsibility of their performances in chemistry classes (48%). But, the ite to All The Above Alternatives obtained a value of 40%, the itis to its teachers only obtained a value of 4% and they did not attribute their performance to the discipline of chemistry. It is remarkable that students, when asked about their performance, make it understood that the role of the chemistry teacher does not seem to influence their learning so much. They also denote, that they are themselves, their own precursors in learning this subject and that the methodology used by their teachers does not seem to have any effects. According to Nascimento (2006): "An important evaluation of textbooks and the problem of their use in chemistry teaching at the high school level finds that the majority of teachers in action use as the main instrumental resource the textbook or material (handout, notes) produced from this.

Therefore, being used, it is to be assumed that its importance on the quality of teaching is decisive." It is from the valorization and use of textbooks in the classroom, and the use of pedagogical tools, that effective learning in chemistry can be guaranteed. The teaching methodology is fundamental for the teaching and learning process between teacher and student to happen in a positive way, with both teachers and students being dedicated and effort.

CONCLUSIONS

In this work, the students' conception of the chemistry teacher's classes at Casimiro Leite de Oliveira school was evaluated through the case study. The subject of chemistry is seen as complicated and interesting, but not demotivating for students. In the opinion of the students, the chemistry teacher's class is good, facilitates the learning of the contents and is interesting. Most students stated that the teacher never took them to the lab for a hands-on class. While others said they only sometimes went to the lab. The students found it interesting when the chemistry teacher related his class to the events of everyday life. Most of the students attributed themselves responsibility for their performance in chemistry. It is expected that this work will serve as a reference for the opening of new channels of discussion and reflection on the teaching and learning process and enable dialogues on this theme in public schools, between teachers and students. To students and teachers, the path of Education is made from the valorization and teaching practices, enabling learning, the transmission of content and the knowledge of students, to be put into practice on a daily life, forming citizens aware of their duties.

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